

REMARKS

Claim 1 and the corresponding statement on page 1 of the specification have been amended to refer to the fact that the important aspect of the invention in terms of lack of obviousness is to recover usable wax products and requires the positive step at the end of the claim of obtaining usable wax products from the bottom stream and/or the at least one side stream. Support for this language is based on page 12, line 6 and on page 15, line 12 with reference to Tables 3 and 4. It is pointed out that the products referred to on page 9, line 26 as being withdrawn along lines 36, 46, 56, and 66 are wax products as per Table 2 on page 11, whereas the product withdrawn from line 76 is a paraffin product, which is optional in accordance with the invention.

Claim 1 has also been amended to refer to the fact that there is substantially no thermal degradation of the feedstock or of the wax products. Support for this change occurs in the last sentence at lines 30-33 of page 4 of the specification.

It is believed that what was clearly intend was "as little as 2%" rather than "less then 2%" to suggest a small amount degradation could be tolerated in practicing the invention, in other words, the degree of degradation less then 2%. With this understanding it is respectfully believed that this modification of the language in claim 1 is fairly based on the disclosure.

It is believed that by directing claim 1 to the recovery of wax products the distinction over the prior art, such as Ireland, is emphasized.

As regards the rejections under 35 USC 103 the examiner contends that Ireland disclosed feeding a Fischer-Tropsch derived paraffinic hydrocarbon feedstock into a distillation column to produce a overheads stream, a side stream and a bottom stream, The Examiner concedes that Ireland does not specifically disclose that the side stream and the bottom stream comprise usable wax products; however, the Examiner then contends that since the Ireland process is similar to the claimed process, the Ireland wax product would have similar

characteristics to the claimed wax products. In other words, the Examiner thereby contends that Ireland teaches the production of usable wax products. In this regard, the Applicant wished to reiterate the following:

Not all waxes are usable. Thus, many waxes are thermally degraded during the production thereof so that they are not directly usable as taught in, for example, page 2 lines 25 to 33 of the present case. As discussed on page 2 line 7 to 11, by "usable wax products" is meant that the wax products have not been non-thermally degraded and that they meet stringent specifications in respect of properties such as congealing point, softness at various temperatures, oil content, etc as set out on page 1 line 17 to page 2 line 6.

Ireland teaches the use of a distillation column 12 to obtain various fractions. There is simply no teaching in Ireland et al that the bottom product, which is withdrawn along the flow line 22, comprises usable wax products, by routing it to a hydrogenation stage 62 where it is subjected to catalytic hydrodewaxing. This clearly show that the bottoms material does not comprise usable wax products.

In Ireland, the naphtha stream, which is withdrawn from the distillation column 12 along the line 16, and the light fuel oil/jet fuel stream, which is withdrawn along the line 18, clearly do not contain usable wax products. The naphtha stream is treated further to produce gasoline while the light fuel/jet fuel fraction is used to produce distillate fuel oil by hydrogenation thereof in the zone 62.

The only side stream in Ireland that could possible contain wax products is the heavy fuel oil, which is withdrawn from the distillation column along the flow line 20. Ireland teaches, in column 9 line 54, that this fraction is a heavy low fluidity fraction. A wax, on the other hand, is non-liquid or non-fluid, ie is solid, firm or plastic, at room temperature.

The only reference that Ireland has to "wax" per se, is in respect of the fraction that is withdrawn from the distillation column 12 along the line 20. Ireland describes this fraction as a "waxy feed" - see column 9 lines 56. However, as previously advised, a person skilled in the art would not consider this fraction to be, or to comprise, usable wax products. This is in fact confirmed by Ireland since it specifies that this fraction must be subjected to catalytic hydrodewaxing in the zone 68 where it is subjected to catalytic cracking to obtain dewaxed oil and gasoline. In other words, the stream withdrawn along the line 20 does not comprise usable wax products as claimed in the process of Claim 1.

That a person of ordinary skill in the art would not at all look to Ireland for guidance on obtaining usable wax products from a Fischer-Tropsch derived paraffinic hydrocarbon feedstock, as claimed in Claim 1, can also be found therein that the main aim of Ireland is to maximize the yield of desirable fuels, ie gasoline and distillate fuel oils - see for example column 1 lines 10 to 16 of Ireland. Thus, thermal degradation and cracking of feedstock components and the products obtained were not factors that were considered in Ireland, and in particular thermal degradation and cracking were not considered undesirable in the process of Ireland. In contrast in the process of the present invention, it was surprisingly found that usable wax products could be obtained directly, i.e., without requiring further treatment upgrading to meet some or most of the specifications listed on page 1 line 17 to page 2 line 6, in a bottom stream and at least one side stream through distillation of a Fischer-Tropsch derived paraffinic hydrocarbon feedstock in a single distillation column and by selecting the distillation condition so that there is no thermal degradation of the feedstock or of the wax products. Such usable wax products are not oils or liquid fuels, and are a totally different class of materials to the fuels of Ireland.

It is clear from the drawing of Ireland et al. that gasoline and distillate fuel are withdrawn from lines 60 and 64 respectively and that the product of the hydrowaxing in zone 68 is passed by conduit 70 to distillation zone 72 (per column 10, lines 51 following). The product withdrawn at line 78 is a heavy fuel oil and that withdrawn by conduit 74 is passed into the system to be withdrawn as



gasoline. In other words no wax product, certainly no usable wax product, was obtained. Therefore, one skilled in the art reading the disclosure of Ireland would not have been influenced to use the indicated system for obtaining usable wax products as recited in amended claim 1.

The Examiner concedes that Ireland does not disclose that the distillation column operates so that there is no thermal degradation of the feedstock or of the wax products. However, the Examiner then contends that it would have been obvious to have modified the process of Ireland by operating its distillation column at conditions that result in no thermal degradation of the feedstock of the wax product because the operation conditions of the distillation column of Ireland are not a critical component. It is respectfully submitted that this argument is not well founded. As previously indicated, there is no suggestion in Ireland to operate its distillation column so that there is no thermal degradation of the feedstock. In contrast, as indicated above, the emphasis in Ireland is to maximize yields of high octane gasoline boiling components and light oil materials suitable for use as diesel fuel. A person skilled in the art would thus only look to Ireland for guidance in how to maximize the production of such liquid fractions, and would receive guidance, as regards the characteristics and operation of a distillation column in which this is effected, in Ireland. Such a person of ordinary skill in the art would find no guidance in Ireland et al on how to operate the distillation column to obtain usable wax products directly from the distillation column in a bottom stream and/or in at least one side stream. To contend that it would be obvious to one of ordinary skill in the art to modify the process of Ireland to obtain no thermal degrading of the feedstock of the wax product is thus pure conjecture. In addition, the contention of the Examiner that "one of skill in the art would operate the Ireland column at any conditions including the claimed conditions to produce different fractions that have different boiling points and it would be expected that the results would be the same or similar when using the claimed condition in the process of Ireland" is a generalization and oversimplification, and is simply not correct.

The Examiner again contends that although Ireland does not disclose

the dimensions and characteristics of the distillation column, it would have been obvious to one of ordinary skill in the art to have modified the Ireland process by utilizing a distillation column having the claimed dimensions and the claimed physical characteristics because the dimensions and characteristics of the column are not a critical component. The Examiner further contends that one of ordinary skill in the art would employ any column including the claimed column to separate a feedstock into at least one overheads stream, one side stream and one bottom stream, and it would be expected that the results would be the same or similar when using the claimed column in the process of Ireland. It is again submitted that these arguments are not well founded since the process of Ireland is clearly different from that of Claim 1. Ireland simply does not at all teach or suggest multiple fractionation of Fischer-Tropsch waxes, to withdraw at least one side stream comprising usable wax products and a bottom stream also comprising usable wax products and furthermore to obtain usable wax product from said bottom stream and/or said at least one side stream.

As regards the rejection of Claim 6, the Applicant reiterates that since Claim 1 is patentable over Ireland, Claim 6 (which depends from Claim 1) must also be patentable. Additionally, the Examiner's attention is again drawn to what is set out in the response filed on 27 August 2001 as well as the response filed on 29 April 2002.

On the basis of the foregoing remarks favorable consideration is respectfully requested.

Respectfully submitted



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In the Specification

This invention relates to distillation. More particularly, the invention relates to a process for distilling paraffinic hydrocarbons, particularly Fischer-Tropsch derived paraffinic hydrocarbons to obtain the usable wax products.

In the Claims

It is requested that claim 1 be amended as follows:

1. (thrice amended) A process for distilling paraffinic hydrocarbons to obtain usable wax products comprising the steps of:

feeding a Fischer-Tropsch derived paraffinic hydrocarbon feedstock comprising heavy paraffinic hydrocarbons and, optionally, light paraffinic hydrocarbons, medium paraffinic hydrocarbons or a mixture thereof, into a distillation column; withdrawing from the distillation column an overhead stream, a bottom stream comprising wax products, and at least one side stream comprising wax products;

[and]

operating the distillation column so that there is substantially no thermal degradation of the feedstock or of the wax products, with the wax products of the bottom stream and of the at least one side stream thus being usable wax products; and obtaining usable wax product from said bottom stream and/or said at least one side stream.